

Memorandum

To: Tiffany Faro
Associate Planner, City of Belmont

From: Brady Finklea, P.E.
Kimley-Horn

Re: *Henry Chapel TIA Update*
RE: Background Growth Calculations

Date: November 10, 2022

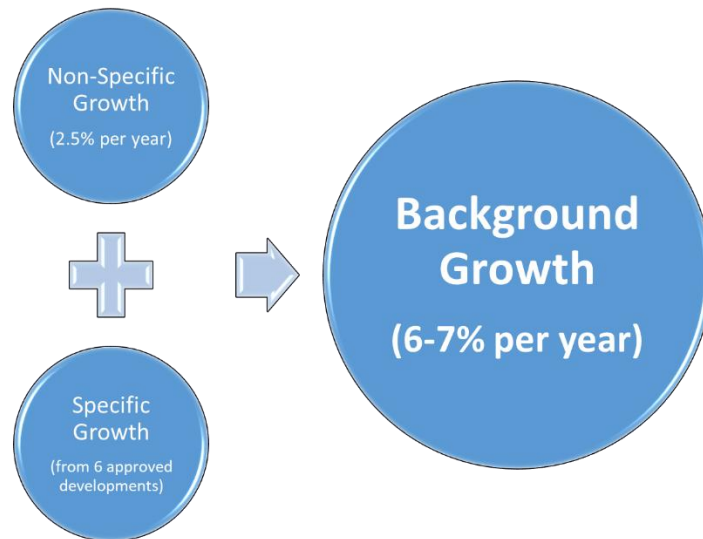
Based on comments received at the community meeting held for the proposed Henry Chapel residential development, the historical background (non-specific) growth rate of 2.5% per year was questioned. The 2.5% annual growth rate is only one (1) component of the background growth. This memorandum provides information to help better understand how the background growth is calculated.

The purpose of background growth in TIAs is to establish a baseline from which to measure solely the traffic impact caused by the proposed site. To do this, we start with the existing traffic volumes (collected through actual traffic counts) and add future traffic volumes that are anticipated to be added to the study area between the existing year and the build-out year (a.k.a. horizon year) – in this case, we had four (4) phased build-out years, so it was growing traffic volumes from 2022 to each of those years through 2026. For the purposes of this memo, we'll use full build-out (2026), so traffic volumes were grown from 2022 to 2026. The importance of this is to establish the baseline in 2026, known as 2026 background – which represents the expected traffic volumes in 2026 without the proposed Henry Chapel traffic. This allows us to solely measure the impact of the Henry Chapel site – to compare the traffic operations between 2026 background vs. 2026 build-out – with the only difference being the addition of Henry Chapel site traffic in the 2026 build-out scenario – and identify mitigation based on a comparison of those two (2) scenarios. This allows us to isolate only the impact of the Henry Chapel site so that it is clear what the impact of the Henry Chapel site is to the study area.

Background growth (growth from 2022 to 2026, absent the Henry Chapel site), consists of two (2) components – both added to the 2022 existing volumes:

1. Non-specific general growth (historical background growth)
 - 2.5% per year
2. Specific growth from specific approved off-site developments that are not yet fully constructed (i.e., the existing traffic volumes collected in 2022 do not incorporate those traffic volumes that we currently assume will be added between 2022 and 2026).
 - Six (6) approved developments added, including traffic from:
 - i. Amberlee
 - ii. Rivermist
 - iii. McLean
 - iv. Belmont Town Center
 - v. South Fork
 - vi. Smith Farm

When adding both of these components together, the existing traffic volumes were increased by a total annual growth rate of approximately **6% per year (AM peak) and 7% per year (PM peak)** in the vicinity of the site between 2022 and 2026.



This methodology is described in **Sections 4.0, 4.1 and 4.2** of the approved *Henry Chapel TIA Update* (Kimley-Horn, August 2022) and attached to this memo. As stated in the TIA, S Point Road (NC 273) has experienced 7.7% annual growth between 2012 and 2018 south of the proposed site near Plant Allen Road, and 5.8% annual growth between the same timeframe just north of the site in the vicinity of Forest Hill Road.

Below is additional reference that describes the recommended methodology for calculating the background (non-site) growth provided by Institute of Transportation Engineers’ (ITE’s) ***Transportation Impact Analyses for Site Development, An ITE Recommended Practice***:

“Components of Background Traffic

Non-site traffic consists of two components:

- Through traffic, consisting of all movements through the study area, without either an origin or a destination in the study area (sometimes referred to as “background growth”); and
- Traffic generated by all other developments in the study area, with an origin and/or a destination in the study area (sometimes referred to as “background development” or “pipeline development”).

Guidance

The growth rate method may help generate reasonably accurate estimates for future conditions out to the horizon year, if used in combination with specific background development sites that are in the vicinity of the proposed new development. In this context, the growth rate method provides information about the background growth of traffic to the horizon year, generally relatable to nonspecified growth outside the study area. The growth attributable to specifically identified development sites in the vicinity of the proposed new site, which will be constructed between the existing or base year and horizon year, provides growth information inside the study area. **The combination of the two provides a reasonable estimate of all growth in the study area not related to the proposed new development site.”**

Attachment:

- Henry Chapel TIA Update – Sections 4.0 – 4.2

4.0 Background Traffic Volume Development

Projected background (non-project) traffic is defined as the expected growth or change in traffic volumes on the surrounding roadway network between the year the existing counts were collected (2022) and the expected build-out years for each phase of development (2023-2026) absent the construction and opening of the proposed project. This includes both non-specific general growth based on historical increase in local traffic volumes (historical background growth), along with specific growth and/or change in traffic volumes caused by approved off-site developments that are not yet fully constructed, and/or planned transportation projects specifically identified within the vicinity of the proposed development.

4.1 HISTORICAL BACKGROUND GROWTH TRAFFIC

Historical background growth is the increase in existing traffic volumes due to usage increases and non-specific growth throughout the area, and accounts for growth that is independent of specific off-site developments or planned transportation projects. Historical background growth traffic is calculated using an annual growth rate, which is applied to the existing traffic volumes up to the future horizon years. As shown in the approved MOU, an annual growth rate of two and one-half percent (2.5%) was applied to the 2022 existing peak-hour traffic volumes to calculate base 2023, 2024, 2025, 2026 and 2031 background traffic volumes. This growth rate was determined based on review of historical NCDOT AADT maps, specifically along S Point Road between 2002 and 2019, in coordination with NCDOT and City of Belmont, along with consideration of the additional specific traffic being added by the six (6) approved developments discussed below.

The southern portion of Belmont is uniquely situated along a peninsula formed between the Catawba River and South Fork River, where S Point Road (NC 273) currently serves as the only north/south collector route along the peninsula. Therefore, as the southern portion of the peninsula has developed and continues to develop, most, if not all, generated traffic is forced to use S Point Road (NC 273). Additionally, this route also serves South Carolina commuters via a nearby bridged connection to York County, South Carolina. The upper state of South Carolina, and in particular York County, has experienced tremendous growth over the past decade, specifically new residential developments attracting new residents looking to commute to Gaston County and Charlotte for work. The impacts of this growth are felt in Belmont and Gaston County and along S Point Road (NC 273). Based on NCDOT AADT maps, S Point Road (NC 273) has experienced 7.7% annual growth between 2012 and 2018 south of the proposed site near Plant Allen Road, and 5.8% annual growth between the same timeframe just north of the site in the vicinity of Forest Hill Road. Considering that this study also includes growth from six (6) specific approved developments (described in **Section 4.2**), the non-specific annual growth rate determined and agreed to be used to calculate base 2023, 2024, 2025, 2026 and 2031 background traffic volumes was identified as 2.5% per year.

4.2 APPROVED DEVELOPMENTS

Based on input from the City of Belmont and NCDOT staff, six (6) nearby approved developments expected to impact traffic volumes within the study area were included in the background traffic volumes for this TIA. The land uses, intensities, approximate build-out percentages at the time the counts were collected and required transportation improvements at overlapping study intersections are outlined in **Table 4.1**.

Table 4.1 – Approved Developments

Development	Land Use/Intensity	% Build-out	TIA Included?	Required Improvements
Amberlee <i>(Nixon Rd)</i>	188 Single-Family units	55%	Yes	<i>Required IMPs at study intersections have already been constructed.</i>
Rivermist <i>(N of Bowen Rd)</i>	86 Single-Family units	0%	No	No required IMPs at study intxs. <i>(SBL on S Point Rd at site drive)</i>
McLean <i>(Armstrong Rd/S New Hope Rd)</i>	845 Single-Family units 100 Townhome units 125k SF Shopping Center 36k SF Marina/boat storage 2k SF Ship store 28k SF Restaurant	50% <i>(of approved trip gen)</i>	Yes	No required IMPs at study intxs.
Belmont Town Center <i>(Btwn Stowe Rd & R L Stowe Rd)</i>	16 Single-Family units 92 Townhome units 27,800 SF General Office 21,600 SF Specialty Retail 53,000 SF Supermarket 4,330 SF FF Restaurant 14 FP Gas Station	90% <i>(of approved trip gen)</i>	Yes	<i>Required IMPs at study intersections have already been constructed.</i>
South Fork¹ <i>(S of Armstrong Ford Rd)</i>	808 Age-restricted SF units 50k SF Grocery 15k SF Pharmacy 10k SF FF Restaurant 30k SF General Retail 25k SF Medical Office	0%	Yes	NC 273/R L Stowe Rd/Nixon Rd - EBR w/100'
Smith Farm <i>(NE of Belwood Dr/NC 273)</i>	19 Single-Family units 57 Townhome units	0%	No	NC 273/Belwood Dr/Belmont MS -Realignment of Belwood Dr to tie into signal at BMS; -SBL w/ 100'

¹Phase 1 of South Fork included in 2025 Build Phase 2 and beyond;
Phases 2+3 of South Fork included in 2031 Build +5 Conditions only.

Site volumes for approved developments were obtained from their respective TIAs with the exception of Rivermist and Smith Farm. For the approved developments that included an approved TIA, the site traffic was extracted from the approved TIAs and applied to the overlapping study intersections. Existing turning-movement splits were used to carry and assign the site volumes appropriately at study area intersections that were not included in the approved studies.

A TIA was not performed for the Rivermist and Smith Farm developments; therefore, trip generation analyses were performed for these two (2) developments using the trip generation rates published in *Trip Generation* (Institute of Transportation Engineers, Eleventh Edition, 2021) as shown in **Table 4.2** below.

ITE LUC	Land Use	Intensity	Daily	AM Peak Hour			PM Peak Hour			
				Total	In	Out	Total	In	Out	
Rivermist										
210	Single-Family Detached Housing	86	DU	878	65	17	48	86	54	32
Smith Farm										
210	Single-Family Detached Housing	19	DU	219	16	4	12	21	13	8
215	Single-Family Attached Homes - (Townhomes)	57	DU	384	24	7	17	30	17	13
Smith Farm Total				603	40	11	29	51	30	21

Site trips associated with these developments were assigned to the study area intersections based on the approved residential trip distribution for the proposed Henry Chapel development further discussed in **Section 5.3**. Based on input provided by City of Belmont and NCDOT staff at the TIA Scoping Meeting, Belwood Drive is required as mitigation for the Smith Farm development to be realigned to tie into the existing signalized tee-intersection of S Point Road (NC 273)/Belmont Middle School to create the fourth leg to this intersection. This modification was assumed to be in place under all future-year conditions.

Trip generation calculations and site trip assignments for these approved developments are included in the **Appendix**. **Figures 4.1** through **4.8** show the projected 2023 through 2026 background AM and PM peak-hour traffic volumes, respectively, that include the historical growth traffic and approved development trips.

4.3 PLANNED TRANSPORTATION PROJECTS

Based on discussions with City staff, this section only references City of Belmont transportation plans that were adopted prior to 2017 when the sketch plan application for the proposed Henry Chapel Residential Development was officially submitted to the City of Belmont for review. Other current NCDOT and GCLMPO transportation plans are provided in this section for reference. However, it is important to note that none of these future transportation projects are currently funded through construction, and therefore none were included in the future-year analyses included in this TIA.

Eight (8) future transportation projects have been identified within the study area along with a number of other surrounding roads identified as needing improvements based on review of the following adopted transportation plans for the area:

- NCDOT’s [2020-2029 State Transportation Improvement Program](#) (STIP or TIP)
- GCLMPO’s [2050 Metropolitan Transportation Plan](#) (MTP)
- GCLMPO’s [Comprehensive Transportation Plan](#) (CTP)
- City of Belmont’s [Bicycle Master Plan](#) (2013)
- City of Belmont’s [Pedestrian Master Plan](#) (2009)
- [Carolina Thread Trail](#)

Below is a summary of these future transportation projects:

1. **S Point Rd (NC 273) and Armstrong Rd (NC 273) Roundabout (U-6150)**
 - Funded for ROW/Utilities FY 2028
 - Construction currently unfunded (beyond 10-year funded STIP window)
 - Based on input at TIA Scoping Meeting and given the current schedule with CNST unfunded, U-6150 will not be included in background conditions.
2. **S Point Road (NC 273) Widening (H184813)**
 - Widen to 4-lane boulevard from R L Stowe Rd to Henry Chapel Rd
 - Included in:
 - 2050 MTP (Unfunded project list)
 - GCLMPO CTP
3. **S Point Road (NC 273) Widening (H193391)**
 - Widen to 4-lane roadway from Henry Chapel Rd to Lower Armstrong Rd
 - Included in:
 - 2050 MTP (Unfunded project list)